FlexiDome2X

VDN-0498

BOSCH

en Installation Manual

Table of Contents

1   Safety

1.1   Safety precautions

DANGER!

High risk: This symbol indicates an imminently hazardous
situation such as "Dangerous Voltage" inside the product.
If not avoided, this will result in an electrical shock, serious
bodily injury, or death.

WARNING!

Medium risk: Indicates a potentially hazardous situation.
If not avoided, this could result in minor or moderate bodily
injury.

CAUTION!

Low risk: Indicates a potentially hazardous situation.
If not avoided, this could result in property damage or risk of
damage to the unit.

1.2 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operating the unit.

1. **Cleaning -** Generally, using a dry cloth for cleaning is sufficient but a moist, fluff-free cloth or leather shammy may also be used. Do not use liquid cleaners or aerosol cleaners.
2. **Heat Sources -** Do not install the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. **Water -** Never spill liquid of any kind on the unit.
4. **Lightning -** Take precautions to protect the unit from power and lightning surges.
5. **Controls adjustment -** Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit.
6. **Power sources -** Operate the unit only from the type of power source indicated on the label.
7. **Servicing -** Unless qualified, do not attempt to service this unit yourself. Refer all servicing to qualified service personnel.
8. **Replacement parts -** Use only replacement parts specified by the manufacturer.
9. **Installation -** Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
10. **Attachments, changes or modifications -** Only use attachments/accessories specified by the manufacturer. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.3   Connection in outdoor applications

1.3.1   Safety precautions

Coax grounding: If an outside cable system is connected to the unit, ensure that the system is grounded.

U.S.A. models only: *Section 810* of the National Electrical Code, *ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to ground electrodes, and requirements for the grounding electrode.

Power lines: An outdoor system should not be located in the vicinity of overhead power lines, electrical lights, or power circuits, or where it may contact such power lines or circuits. When installing an outdoor system, extreme care should be taken to keep from touching power lines or circuits, as this contact may be fatal. U.S.A. models only - refer to the National Electrical Code *Article 820* regarding installation of CATV systems.

24 VAC power source: This unit is intended to operate with a limited power source, this power source must comply with *EN60950*. The unit is intended to operate at 24 VAC. User supplied wiring, from 24 VAC supply to unit, must be in compliance with electrical codes (Class 2 power levels). Do not ground the 24 VAC supply at the terminals or at the unit's power supply terminals.

Connection: The unit has connection terminals on flying leads. In wet or outdoor installations make use of the VDA-455SMB accessory or use a field wiring box with Nema 3 or IP55 protection level or better. Make the connections inside the water tight compartment. After connections are made ensure that the watertight compartment is tightly closed and cables and conduits are properly sealed to prevent ingress of water.

> **CAUTION!**
> The Low Voltage power supply unit must comply with EN/UL 60950. The power supply must be a SELV-LPS unit or a SELV - Class 2 unit (Safety Extra Low Voltage - Limited Power Source).

	Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*

1.4   FCC information

FCC & ICES Information

(U.S.A. and Canadian Models Only)

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to *part 15* of the *FCC Rules*. These limits are designed to provide reasonable protection against harmful interference in a **residential installation**. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– reorient or relocate the receiving antenna;
– increase the separation between the equipment and receiver;
– connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
– consult the dealer or an experienced radio/TV technician for help.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

Informations FCC et ICES

(modèles utilisés aux États-Unis et au Canada uniquement)
Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **classe B**, en vertu de la *section 15 du règlement* de la *Commission fédérale des communications des États-Unis (FCC)*, et en vertu de la norme *ICES-003 d'Industrie Canada*. Ces exigences visent à fournir une protection raisonnable contre les interférences nuisibles lorsque l'appareil est utilisé dans le cadre d'une **installation résidentielle**. Cet appareil génère, utilise et émet de l'énergie de radiofréquences et peut, en cas d'installation ou d'utilisation non conforme aux instructions, engendrer des interférences nuisibles au niveau des radiocommunications. Toutefois, rien ne garantit l'absence d'interférences dans une installation particulière. Il est possible de déterminer la production d'interférences en mettant l'appareil successivement hors et sous tension, tout en contrôlant la réception radio ou télévision. L'utilisateur peut parvenir à éliminer les interférences éventuelles en prenant une ou plusieurs des mesures suivantes:

–   Modifier l'orientation ou l'emplacement de l'antenne réceptrice;
–   Éloigner l'appareil du récepteur;
–   Brancher l'appareil sur une prise située sur un circuit différent de celui du récepteur;
–   Consulter le revendeur ou un technicien qualifié en radio/ télévision pour obtenir de l'aide.

Toute modification apportée au produit, non expressément approuvée par la partie responsable de l'appareil, est strictement interdite. Une telle modification est susceptible d'entraîner la révocation du droit d'utilisation de l'appareil.
La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s'avérer utile : *How to Identify and Resolve Radio-TV Interference Problems (Comment identifier et résoudre les problèmes d'interférences de radio et de télévision)*. Cette brochure est disponible auprès du U.S. Government

Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

1.5   UL certification

Disclaimer

Underwriter Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer

Underwriter Laboratories Inc. ("UL") has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.

UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

1.6   Bosch notice

More information

For more information please contact the nearest Bosch Security Systems location or visit *www.boschsecurity.com*

2   Introduction

2.1   Features

The FlexiDome2X camera is a small, discreet, high-performance surveillance dome containing a high-performance 1/3-inch CCD sensor camera with integral varifocal lens. This surveillence dome can be mounted to an electrical box, to a wall, to a ceiling or in a corner. The sturdy construction and the high impact-resistant polycarbon dome protect the camera module from damage. The camera incorporates advanced (20-bit) digital signal processing and a wide dynamic range CCD sensor for outstanding picture performance.

The FlexiDome2X camera is easy to install and ready to use, and offers the best solution for demanding scene conditions.

Features include:

– 1/3-inch CCD sensor with wide dynamic range (WDR)
– True Day/Night performance with switchable IR filter
– 540 TVL resolution
– Indoor and outdoor use
– IP66 and NEMA 4X compliant
– High-impact, vandal resistant (exceeds IK10, >50J)
– Dynamic engine including Smart BLC
– Adaptive dynamic noise reduction
– Privacy zones
– Autoblack
– Bilinx (bi-directional coaxial communication)
– Flush, surface, wall-pendant, pipe-pendant or corner mount
– Wide operating temperature range (-50 to +55 °C / -58 to +131 °F)
– Six pre-programmed operation modes
– Adaptive dynamic noise reduction
– Multiple language on-screen display
– Built-in test pattern generator

3   Installation

3.1   Unpacking

Unpack carefully and handle the equipment with care.
The packaging contains:
–   Integrated FlexiDome camera unit
–   Important safety instructions
–   Quick install instructions
–   CD ROM
     –   Installation Instructions
     –   Adobe Acrobat Reader
–   Plastic bag with mounting hardware (three SX8 4.5-6 mm
     mounting plugs and three matching mounting screws), and
     special screwdriver bit for tamper-resistant screws
–   Plastic bag with two black rubber grommets for surface
     mount box
–   Lens adjustment cap
If equipment has been damaged during shipment, repack it in
the original packaging and notify the shipping agent or supplier.

WARNING!
Installation should only be performed by qualified service
personnel in accordance with the National Electrical Code or
applicable local codes.

CAUTION!
The camera module is a sensitive device and must be handled
carefully.

3.2 Disassembly

The flush-mount version consists of the following parts:

Camera module and mounting base

Inner liner (with sealing ring)

Trim ring

Dome
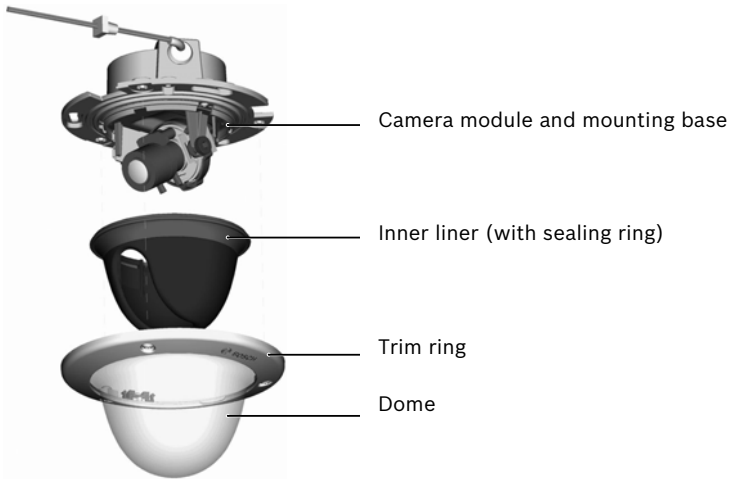
Figure 3.1 Flush-mount

The surface-mount version consists of the following parts:

Surface mounting box

Camera module and mounting base

Inner liner (with sealing ring)
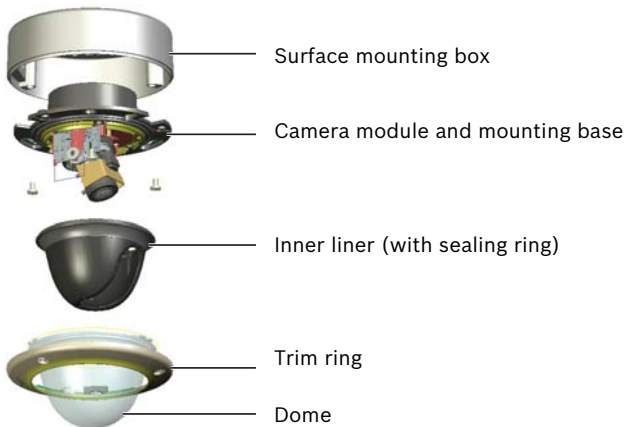
Trim ring

Dome

Figure 3.2 Surface-mount

To disassemble the unit proceed as follows:

1. Use the special screwdriver bit to loosen the three tamper-resistant screws in the trim ring (the screws remain in place).
2. Remove the trim ring and dome by pulling them from the base.
3. Remove the inner liner (with sealing ring) by pulling it off of the base.
4. Remove the pink protective foam.

3.3 Mounting the unit

There are several ways to mount the unit. The method of mounting depends on the type of surface and whether other mounting hardware, such as an electrical box, a surface box or other accessories are used.

Note:
If the unit is to be surface mounted, then use the Surface Mount Box (SMB). The SMB is sold as a separate item (VDA-455SMB) or is included with the FlexiDome2X with the surface mount option. Other mounting accessories are also sold separately.

3.3.1 Mounting tips

–   Use the mounting hole template to assist in marking the correct position for the camera to be mounted.
–   Refer to the dimensions on the mounting hole template to find the exact position of the screw holes and the entry hole for the cables.
–   Partially screw in two screws for the keyholes and use them to temporarily hang the camera while the connections are made.

3.3.2 Flush mounting
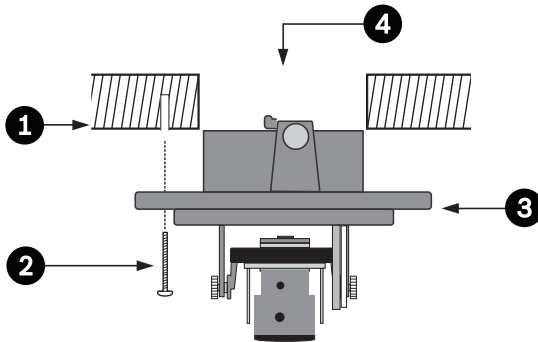
Figure 3.3 Flush mounting - hollow surface

1. Solid surface (pre-drill three 8mm holes and fit supplied plugs)
2. Three screws (supplied with camera)
3. Integrated camera unit and base
4. Cables
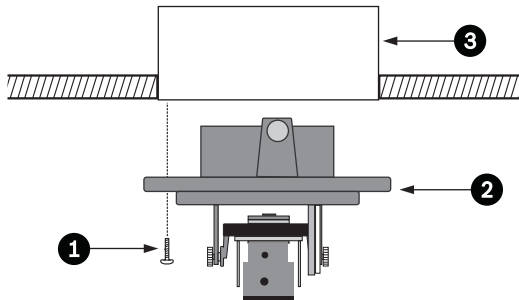
Figure 3.4 Flush mounting - electrical box (4S)

1. Two screws (not supplied)
2. Integrated camera unit and base
3. 4S electrical box

3.3.3   Surface mounting

When using the surface mounting box:

–   With a side connection, remove the cap covering the side entrance.

     With a rear connection, leave the cap in place.

–   Attach the conduit to the mounting box.

–   Release the two clips at the bottom of the watertight connection compartment to remove it from the mounting box.

–   Open the cover of the watertight compartment in the mounting box by releasing the five clips.

–   Run the power and video cables through separate rubber grommets into the watertight compartment.

–   Run the cable from the camera into the watertight compartment through the supplied grommet.

–   Make the connection inside the watertight compartment and clip on the cover to seal it.
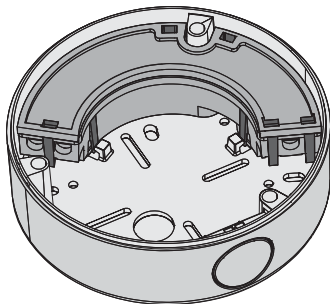
Figure 3.5   Surface mounting box VDA-455SMB

Note:

To ensure a watertight cable entry, use round cables of between 5 and 6 mm (0.2 - 0.24 inches) for power and video connection.

Note:

Use some silicon spray on the cable to help slide the grommets onto it.
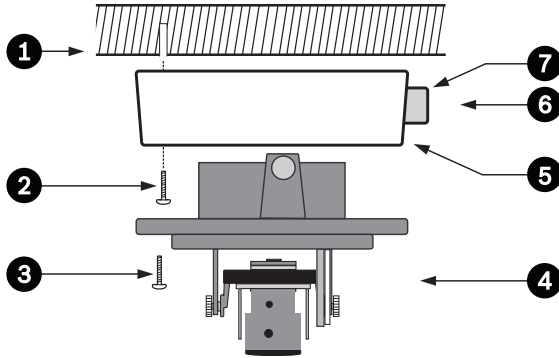
Figure 3.6 Surface mounting - side connection

1. Solid surface (pre-drill three 8mm holes and fit supplied plugs)
2. Three screws (supplied with camera)
3. Three screws (M5, supplied)
4. Integrated camera unit and base
5. Surface mounting box (VDA-455SMB)
6. Cables
7. Conduit
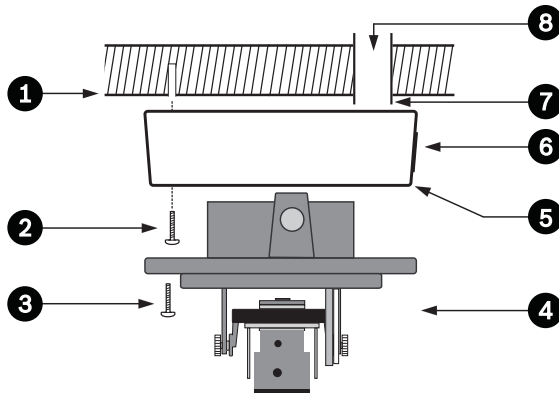
Figure 3.7 Surface mounting - rear connection

1. Solid surface (three pre-drilled 8mm holes and fit supplied plugs)
2. Three screws (supplied with camera)
3. Three screws (M5, supplied)
4. Integrated camera unit and base
5 Surface mounting box (VDA-455SMB)
6. Cap (remove for side-entry cables)
7. Conduit
8. Cables

4   Connection and set-up

4.1   Power and video connections

The wiring harness has a BNC connector to accept the video coax cable (with male BNC connector) and two stripped low voltage power wires for connection to a power connector. A UTP adapter (VDA-455UTP) is available as an optional accessory to allow a UTP video cable to be connected to the BNC connector.

⚠ **WARNING!**
Before proceeding, disconnect the power from the power supply cable. Ensure that the voltage of the unit matches the voltage and type of the power supply being used.

The easiest way to connect the cables is as follows:
1.   Bring the building connections through the surface cable hole so that they hang clear.
2.   Partially insert two screws into the pre-drilled holes (or adapter plate).
3.   Using one of the keyholes, hang the mounting base of the camera module on one screw temporarily; tilt the base slightly to gain access to the cable connections.
4.   Connect the BNC connector of the camera module to the video coax cable.
5.   Connect the stripped power wires (red +, brown −) to the power supply connector.

Note
For a **DC supply** the polarity is important. Incorrect polarity does not damage the camera but it will not switch on.
For an **AC supply** maintain a consistent wiring polarity in multiple camera systems to help avoid potential camera video rolling.

6. In damp environments ensure that the connections are sealed. (The surface mounting box and the other mounting accessories have a sealed compartment for this purpose.)
7. Push the connections back through the surface cable hole.
8. Secure the mounting base of the camera module to the surface with three screws.

4.2 Setting up the camera

4.2.1 Camera positioning

⚠️ **CAUTION!**

The Heater will be **hot** when in operation - **Do not touch**.
Always switch the heater **off** when working on the camera, refer
to *Section 4.2.4 Heater, Page 26* and *Section 5.6.2 Connections
submenu, Page 42*.

To assist in setting up the camera, connect a monitor to the
miniature 2.5 mm jack socket (2). This socket provides a
composite video signal (with sync). An optional cable (code
number S1460) is available for making this connection. When
the S1460 cable is attached, there is no video available on the
BNC connector to avoid interference.
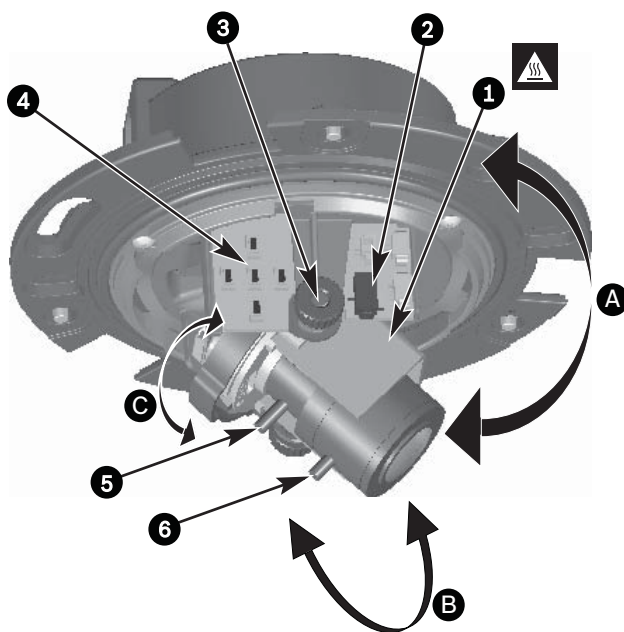
Figure 4.1   Camera parts

1. Heater
2. Monitor jack socket
3. Thumbwheels

4.   Navigation buttons (5)
5.   Focal length
6.   Focus
A.   Pan-axis rotation
B.   Tilt-axis rotation
C.   Twist-axis rotation

The physical default position of the camera is that the top of the image corresponds to the indication **TOP**.

CAUTION!

CCD image sensors are highly sensitive and require special care for proper performance and extended lifetime. Do not expose them to direct sunlight or bright spotlights in operating and non-operating conditions. Avoid bright lights in the field of view of the camera.

The camera module position can be adjusted along three axes. When adjusting the camera position, ensure that the picture display on the monitor is level. Set the camera to the desired position by performing the following steps:

– For horizontal adjustment along the pan axis (A), rotate the camera module in the base. Do not rotate more than 360°.
– To obtain a horizontal horizon (for tilted ceilings or sidewall mounting), rotate the base of the lens along the twist axis (C) to align the picture shown on the monitor. Do not rotate more than 340°.
– For vertical adjustment along the tilt axis (B), loosen thumbwheels, position camera, then gently tighten thumbwheels to secure camera. Do not rotate more than 90°.

4.2.2   Menu navigation

Five keys, located on the side panel, are used for navigating through the menu system.
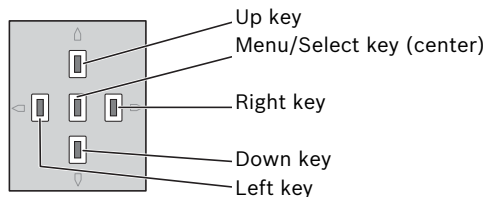
Figure 4.2   Navigation

– Press the menu/select (center) key to access the menus or to move to the next or previous menu.
– Press the menu/select key for approximately 2 seconds to open the **Install** menu.
– Use the up or down keys to scroll through a menu.
– Use the left or right keys to move through options or to set parameters.
– When in a menu, quickly double-press the menu/select key to restore the selected item to its factory default.
– To close all menus at once from any menu, select the **Exit** item and hold down the menu/select key until the menu display disappears.

4.2.3 Focal length and focus

Before adjusting the focal length or focus, place the lens adjustment cap on the lens to ensure that the image sharpness is the same as when the dome is in place.

1. Connect a monitor or other display device to either the camera's BNC connector or to the optional cable (S1460) on the monitor jack. (If S1460 is connected, there is no signal on the BNC connector.)
2. Press and hold the menu/select (center) button until the **Install** menu appears.
    -   The **Set focus** item is highlighted. Do not change this selection as the camera is now in a special mode for adjusting focus.
3. To set the field of view of the varifocal lens, loosen the focal length screw and turn the mechanism until the required view is displayed on the monitor. (Image goes out of focus.)
4. Focus the image on the monitor by loosening the focus screw and turning the mechanism until the image is in focus.
5. Re-adjust the focal length if necessary.
6. Repeat these two adjustments until the desired view is in focus.
7. Tighten both screws.
8. Use the navigation buttons to move to **Exit** and press the center button until the menu disappears.
9. Remove the lens adjustment cap from the lens and disconnect the monitor.

4.2.4 Heater

When using the camera at low temperatures, set the heater setting to **Auto** in the **Install** menu. The heater turns on at ambient temperatures below 0°C (+32°F).

4.2.5   **Closing the unit**

When the camera position is set and all adjustments have been made, close the unit.

1.   Place the inner liner (with attached sealing ring) in position, aligning its fin with the bracket on the base.
2.   Place the dome onto the base and rotate until it clips into place. (If necessary clean its surface with a soft cloth.)
3.   Place the trim ring over the dome.
4.   Align the tamper-resistant screws in the trim ring with the threaded ends in the mounting base.
5.   Use the special screwdriver bit supplied to tighten the three tamper-resistant screws.

5   Configuration

The camera normally provides an optimal picture without the need for further adjustments. There are six pre-defined modes with settings to make configuration easier. Advanced set-up options are available in a menu system for getting the best results under special circumstances.
The camera implements your changes immediately so that before and after settings are easily compared.

5.1   Menu access

Use the five navigation buttons on the camera for selecting and navigating through the various menus. There are two upper level menus: a **Main** menu and an **Install** menu. The menus have functions that can be selected directly or submenus for more detailed set-up. Use the up/down, right/left buttons for navigation.
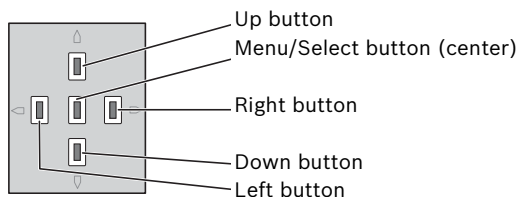
5.1.1   Main menu

To access the **Main** menu, press the menu/select button (center) for less than 1 second. The **Main** menu appears on the monitor. The **Main** menu allows you to select and set-up the picture enhancement functions. If you are not happy with your changes, you can always recall the default values for the mode.

5.1.2   Install menu

The camera also has an **Install** menu in which the installation settings can be set. To access the **Install** menu, press the menu/select button (center) for longer than 1 second.

5.2　Pre-defined modes

There are six pre-defined modes with settings to make configuration easier. You can select one of the six pre-defined modes in the Install/Mode submenu. The modes are defined as follows:

1. **24-hour**
   Default installation mode to provide stable pictures over a 24-hour period. These settings are optimized for out-of-the-box installation.

2. **Traffic**
   Capture high-speed objects using default shutter in variable lighting conditions.

3. **Low light**
   Provide extra enhancement, such as AGC and SensUp to make usable pictures in low-light conditions.

4. **Smart BLC**
   Settings optimized to capture details in high contrast and extremely bright-dark conditions.

5. **Low noise**
   Enhancements are set to reduce picture noise. Useful for conditional refresh DVR and IP storage systems because reducing noise reduces the amount of storage required.

6. **Analog systems**
   Use this mode if the camera is connected to a purely analog system (e.g. matrix switcher with VCR) or to a CRT monitor. Useful mode for evaluating/demonstrating the camera when it is directly connected to a CRT monitor.

5.3   Day/Night switching

The camera is equipped with a motorized IR filter. The mechanical IR filter can be removed in low-light or IR illuminated applications by software configuration settings. If **Auto** switching mode is selected, the camera automatically switches the filter depending on the observed light level. The switching level is programmable. In **Auto** switching mode the camera prioritizes motion (the camera gives sharp images without motion blur as long as the light level permits) or color (the camera gives color pictures as long as the light level permits). The camera recognizes IR illuminated scenes to prevent unwanted switching to color mode.

There are four different methods of controlling the IR filter:

– via an alarm input,
– via Bilinx communication,
– automatically, based on the observed light levels, or
– as part of the programmable mode profile.

5.4   Camera control communication (Bilinx)

This camera is equipped with a coaxial communications transceiver (also refered to as Bilinx). In combination with VP-CFGSFT, the camera setting can be changed from any point along the coaxial cable. All menus can be accessed remotely giving full control of the camera. With this method of communication it is also possible to disable the local keys on the camera.

To avoid loss of communication on an installed camera, the **Communication On/Off** selection is not available while using remote control. This function can only be accessed with the camera buttons. Bilinx communications can only be disabled using the buttons on the camera.

Disabled camera buttons

When the Bilinx communications link is active, the buttons on the camera are disabled.

5.5 Main menu structure

Item	Selection	Description
Mode	Submenu	Sets up operating modes 1 to 6
ALC	Submenu	Video level control
Shutter/AGC	Submenu	Shutter and automatic gain control
Day/Night	Submenu	Day/Night for color/mono operation
Enhance / Dynamic Engine	Submenu	Picture enhancement and performance
Color	Submenu	White balance and color rendition
VMD	Submenu	Video motion detection

5.5.1 Mode submenu

Item	Selection	Description
Mode	1 to 6	Selects operating mode.
Mode ID	Alphanumeric	Mode name (11 characters maximum)
Copy active mode	Available mode numbers	Copies current mode settings to the mode number selected.
Default mode	Submenu	Restores camera to the factory default settings.
EXIT		Returns to main menu.

5.5.2   ALC submenu

Item	Selection	Description
ALC level	-15 to +15	Selects the range within which the ALC will operate. A positive value is more useful for low-light conditions; a negative value is more useful for very bright conditions. Some ALC adjustment may improve scene content when Smart/BLC is enabled.
Peak/average	-15 to +15	Adjusts the balance between peak and average video control. A negative value gives more priority to average light levels; a positive value gives more priority to peak light levels. Video iris lens: choose an average level for best results (peak settings may cause oscillations).
ALC speed	Slow, medium, fast	Adjusts the speed of the video level control loop. For most scenes it should remain at the default value.
DVR/IP Encoder	On, Off	On - The camera output is optimized for connection to a DVR or IP encoder to compensate for compression methods. Off - The camera output is optimized for connection to an analog system (matrix switcher or monitor.
EXIT		Returns to main menu.

5.5.3 Shutter/AGC submenu

Item	Selection	Description
Shutter	AES, FL, Fixed	AES (auto-shutter) - the camera automatically sets the optimum shutter speed. FL - flickerless mode avoids interference from light sources. FIXED - allows a user defined shutter speed.
Default (AES) shutter or Fixed shutter	1/50 (PAL), 1/60 (NTSC) 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/5000, 1/10K	In AES mode, the camera tries to maintain the selected shutter speed as long as the light level of the scene is high enough. In Fixed mode, selects shutter speed.
Actual shutter		Displays the actual shutter value from the camera to help compare lighting levels and optimum shutter speed during set-up.
Gain control	On, Fixed	On - the camera automatically sets the gain to the lowest possible value needed to maintain a good picture. Fixed - sets Fixed AGC value.
Maximum AGC or Fixed AGC	0 to 30 dB	Selects the maximum value the gain can have during AGC operation. Selects the gain setting for Fixed gain operation (0 is no gain).
Actual AGC		Displays the actual AGC value from the camera to help compare gain level with lighting levels and picture performance.

Item	Selection	Description
SensUp Dynamic	Off, 2x, 3x, ..., 10x	Selects the factor by which the sensitivity of the camera is increased. It is dynamic and so is only active when light levels are low. When active, some noise or spots may appear in the picture. This is normal camera behavior. It may also cause motion blur on moving objects.
EXIT		Returns to main menu.

5.5.4   Day/Night submenu

Item	Selection	Description
Day/Night	Auto, Color, Monochrome	Auto - the camera switches the IR cut-off filter on and off depending on the scene illumination level. Monochrome - the IR cut-off filter is removed, giving full IR sensitivity. Color - the camera always produces a color signal regardless of light levels.
Switch level	-15 to +15	Sets the video level in Auto mode at which the camera switches to monochrome operation. A low (negative) value means that the camera switches to monochrome at a lower light level. A high (positive) value means that the camera switches to monochrome at a higher light level.

Item	Selection	Description
Priority	Motion, Color	In AUTO mode: Color - the camera gives a color image as long as the light level permits. Motion - the camera avoids motion blur as long as the light level permits (it switches to monochrome earlier than it would with Color priority).
IR contrast	Enhanced, Normal	Enhanced - the camera optimizes contrast in applications with high IR illumination levels. Select this mode for IR (730 to 940 nm) light sources and for scenes with grass and green foliage. Normal - the camera optimizes contrast in mono applications with visible light illumination.
Color burst (mono)	On, Off	Off - the color burst in the video signal is switched Off in monochrome mode. On - the color burst remains active even in monochrome mode (required by some DVRs and IP encoders).
EXIT		Returns to main menu.

5.5.5   Enhance / Dynamic Engine submenu

Item	Selection	Description
Dynamic Engine	Off, XF-DYN, 2X-DYN, SmartBLC	Off: - turns off all automatic scene detail and enhancments (only recommended for testing). XF-DYN: - extra internal processing is enabled for low-light applications (traffic, etc.). 2X-DYN: - 2X-Dynamic adds dual sensor exposure to the XF-DYN features. In harsh lighting conditions pixels from each exposure are mixed to give a more detailed image (use 2X-DYN when SmartBLC is not required). SmartBLC: - BLC window and weighting factor are automatically defined. Camera dynamically adjusts these for changing light conditions. Includes all the benefits of 2X-DYN.
Autoblack	On, Off	Autoblack On automatically increases the visibility of details even when scene contrast is less than full-range due to mist, fog, etc.
Black level	-50 to +50	Adjusts the black offset level. A low (negative) value makes the level darker. A high (positive) value makes the level lighter and may bring out more detail in the darker areas.
Sharpness	-15 to +15	Adjusts the sharpness of the picture. 0 corresponds to the default position. A low (negative) value makes the picture less sharp. Increasing sharpness brings out more detail. Extra sharpness can enhance the details of license plates, facial features and the edges of certain surfaces.

Item	Selection	Description
Dynamic noise reduction	Auto, Off	In AUTO mode the camera automatically reduces the noise in the picture. This may cause some motion blur on exceptionally fast moving objects immediately in front of the camera. This can be corrected by widening the field of view or selecting Off.
Peak White Invert	On, Off	Use Peak White Invert to reduce glare from the CRT/LCD display. Use in ANPR/LPR applications to reduce headlight glare. (Test on-site to ensure that it does benefit the application and is not distracting for operators of the security system.)
EXIT		Returns to main menu.

5.5.6   Color submenu

Item	Selection	Description
White balance	ATW, AWBhold, Manual	ATW - Auto tracking white balance allows the camera to constantly adjust for optimal color reproduction. AWBhold - Puts the ATW on hold and saves the color settings. Manual - the Red, Green, and Blue gain can be manually set to a desired position.
Speed	Fast, Medium, Slow	Adjusts the speed of the white balance control loop.
Red gain	-5 to +5	ATW and AWBhold - adjusts the Red gain to optimize the white point.
	-50 to +50	Manual - adjusts the Red gain.

Item	Selection	Description
Blue gain	-5 to +5	ATW and AWBhold - adjusts the B gain to optimize the white point.
	-50 to +50	Manual - adjusts the Blue gain.
Green gain	-50 to +50	Manual - adjusts the Green gain.
Saturation	-15 to +5	Adjusts the color saturation. -15 gives a monochrome image.
EXIT		Returns to main menu.

5.5.7   VMD submenu

Item	Selection	Description
VMD	Off, Silent, OSD	Off - Video Motion Detection (VMD) is off. Silent - video motion generates silent alarm. OSD - video motion generates on-screen text message alarm.
VMD area	Submenu	Select to enter the area set-up menu to define the detection area.
Motion indicator		Indicates the peak of measured motion in the selected area. Press either the right, left or center navigation button to reset.
VMD sensitivity		Sets the sensitivity for motion to the desired level. The longer the white bar, the more motion is required to acitvate the VMD alarm. Motion above this level triggers alarm.
OSD alarm text	Alphanumeric	Text for on-screen display alarm (16 characters maximum).
EXIT		Returns to main menu.

Selecting an area for VMD masking

To set-up an area for VMD masking, access the area menu by selecting the **VMD Area** option from the VMD menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. The flashing corner of the image can be moved with the Up, Down, Left, Right arrow keys. Pressing the Select key moves the flashing cursor to the opposite corner, which can now be moved. Pressing Select again freezes the area and exits the area menu.

There is one programmable VMD area.

Note:

When VMD is enabled, normal light fluctuations or environmental factors can contribute to false-positive alarms. Because of this, it is recommended that you do **not** connect the VMD-triggered alarm output of the camera to a monitored alarm system as the false-positive alarms may be considered a nuisance.

5.6   Install menu structure

Item	Selection	Description
Language	Submenu	Select on-screen display (OSD) language
Synchronization	Submenu	Sets synchronization parameters.
Connections	Submenu	Connection parameters
Test signals	Submenu	Test patterns and texts
Camera ID	Submenu	Select to access ID submenu
Privacy masking	Submenu	Sets up a masking area
Default ALL	Submenu	Returns all settings for all modes to factory defaults
Set backfocus now		Select to close the Install menu and open the lens wizard. Adjust the focus as described in *Section 4.2.3 Focal length and focus*. When finished adjusting, press the Up or Down navigation button to exit the lens wizard and open the Install menu again.

5.6.1 Language submenu

Item	Selection	Description
Language	English Spanish French German Portuguese Polish Italian Dutch Russian	Displays the menus on the OSD in the choosen language.
EXIT		Returns to Install menu.

5.6.2 Connections submenu

Item	Selection	Description
Notch filter	On, Off	Switches notch filter on or off. The notch filter can remove a Moiré pattern or color artifacts caused by closely spaced vertical lines or objects (e.g. vertical security bars over windows).
Heater	Off, Auto	Select Auto to enable the thermostatically controlled heater function. The heater turns on at approximately 0 °C (+32 °F).
Bilinx Comms.	On, Off	If Off, Bilinx communications is disabled.
EXIT		Returns to Install menu.

5.6.3   Test signal submenu

Item	Selection	Description
Show camera ID	Off, On	Select On to overlay the camera ID on the video test signal.
Test pattern	Color bars 100%, Grayscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane	Select the desired test pattern to help installation and fault-finding.
EXIT		Returns to Install menu.

5.6.4 Camera ID submenu

Item	Selection	Description
Camera ID		Enter a 17-character camera name. Use Left/Right to change position in the string; use up/down to select character. Use Select to exit.
Display ID pos.	Off, Top left, Top right, Bottom left, Bottom right	Select the screen position of the camera ID.
Camera ID border	On, Off	Displays a grey border behind the camera ID to make it easier to read.
MAC address		Shows MAC address (factory set, cannot be changed).
Ticker bars	On, Off	The ticker bar moves continuously to show that the image is live and not frozen or played back.
Display mode ID	Off, Top left, Top right, Bottom left, Bottom right	Camera mode is displayed on the screen in the selected position.
EXIT		Returns to Install menu.

5.6.5   Privacy masking submenu

Item	Selection	Description
Pattern	Black, Grey, White, Noise	Selects pattern for all masks.
Mask	1, 2, 3, 4	Four different areas can be masked.
Active	On, Off	Turns each of the four masks on or off.
Window	Submenu	Select to open a window in which to define the mask area.

Selecting an area for privacy masking

To set-up an area for privacy masking, access the area menu by selecting the **Area** option from the privacy masking menu. Upon entering the **Area** menu, the current area is displayed with the upper left corner flashing. The flashing corner of the image can be moved with the Up, Down, Left, Right arrow keys. Pressing the Select key moves the flashing cursor to the opposite corner, which can now be moved. Pressing Select again freezes the area and exits the area menu.

There are four programmable privacy mask areas.

5.6.6   Defaults submenu

Item	Selection	Description
Restore All	No, Yes	Restores all settings of the six modes to their default (factory) values. Select YES then press the Menu/Select button to restore all values. When completed the message RESTORED! is shown.

6   Troubleshooting

6.1   Resolving problems

The following table is intended to help you identify the causes of malfunctions and correct them when possible.

Malfunction	Possible causes	Solution
No image transmission to remote location.	Defective camera.	Connect a local monitor to the camera and check the camera function.
	Faulty cable connections.	Check all cables, plugs, contacts and connections. When using DC power ensure that polarity is correct.
No connection established, no image transmission.	The unit's configuration.	Check all configuration parameters.
	Faulty installation.	Check all cables, plugs, contacts and connections.

6.2   Customer service

If you cannot resolve a fault, please contact your supplier or system integrator, or contact Bosch Security Systems Customer Service directly.

The Installer should write down all information regarding the unit so that it can be referenced for warranty or repair. The version numbers of the firmware and other status information can be seen when the unit starts or by opening the **Install** menu. Note down this information and the information found on the camera label before contacting customer service.

7   Maintenance

7.1   Repairs

CAUTION!

Never open the casing of the camera. The unit does not contain any user serviceable parts. Ensure that all maintenance or repair work is performed only by qualified personnel (electrical engineering or network technology specialists). If in doubt, contact your dealer's technical service center.

7.1.1   Transfer and disposal

The camera should only be passed-on together with this installation guide. The unit contains environmentally hazardous materials that must be disposed of according to law. Defective or superfluous devices and parts should be disposed of professionally or taken to your local collection point for hazardous materials.

8 Technical Data

8.1 Specifications

Type number	VDN-498V03	VDN-498V09
Lens focal length	2.8 to 10 mm	9 to 22 mm
F-stop	F1.2	F1.4
Minimum Illumination	0.28 (0.027) lx (fc) 30IRE 0.099 (0.0092) mono	0.32 (0.03) lx (fc) 30IRE 0.11 (0.01) mono
Active pixels	752 x 582 (PAL - 11), 768 x 494 (NTSC - 21)	
Rated supply voltage	24 VAC (±10%) or +12 VDC (±10%)	

All versions

Imager	1/3-inch interline CCD
Resolution	540 TVL
SNR	> 50 dB
Video output	1 Vpp, 75 Ohm
Synchroniza-tion	Internal or Line Lock selectable
Shutter	AES (1/60 [1/50] to 1/10000) customer selectable AES (1/60 [1/50] to 1/15000) automatic flickerless, fixed selectable
Day/Night	Color, Mono, Auto
Sens Up	Adjustable from Off to 10x
AGC	AGC On or Off (0 - 30 dB) selectable
Dynamic engine	XF-Dynamic, 2X-Dynamic, SmartBLC
DNR	Automatic noise filtering On/Off selectable
Sharpness	Sharpness enhancement level selectable
White Balance	ATW, AWBhold and manual (2500 to 10000K)
Color saturation	Adjustable from monochrome (0%) to 133% color

ALC lens	DC iris
Test pattern generator	Color bars 100%, Greyscale 11-step, Sawtooth 2H, Checker board, Cross hatch, UV plane
Video Motion Detection (VMD)	One area, fully programmable
Privacy Masking	Four independent areas, fully programmable; black, white, grey, noise
Communication	Two-way Bilinx (bi-directional)
Languages (OSD)	English, Spanish, French, German, Portuguese, Polish, Italian, Dutch, Russian
Modes	6 programmable (preset) modes: 24-hour, Traffic, Low-light, SmartBLC, Low noise, Analogue systems
Peak White Invert	Suppresses highlights in scenes
Misc.	Notch filter, Actual AGC, Actual shutter, IR contrast
Power consumption	12 VDC 400 mA 24 VDC 330 mA
Weight	550 g (1.21 lb)
Operating temperature	-30 °C to +55 °C (-22 °F to +131 °F) (-50 °C [-58 °F] with heater enabled)
Controls	OSD with softkey operation

8.1.1   Dimensions
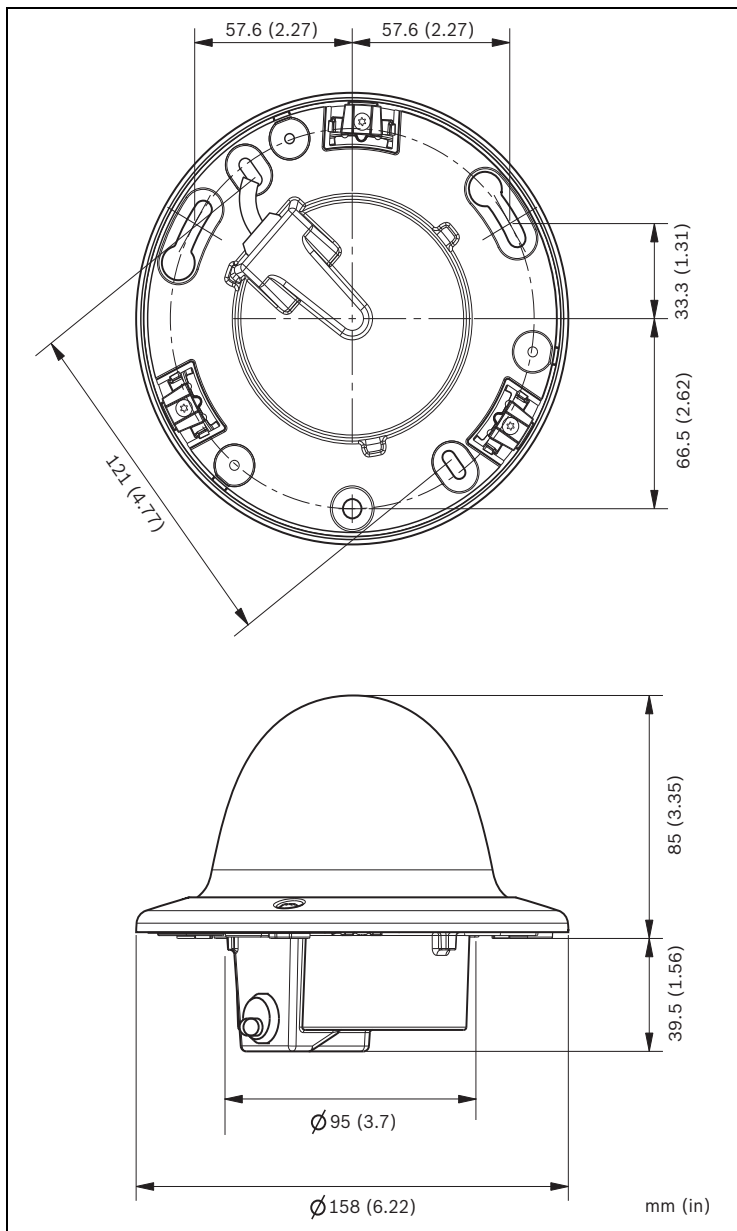
Figure 8.1   Dimensions - Flush-mount
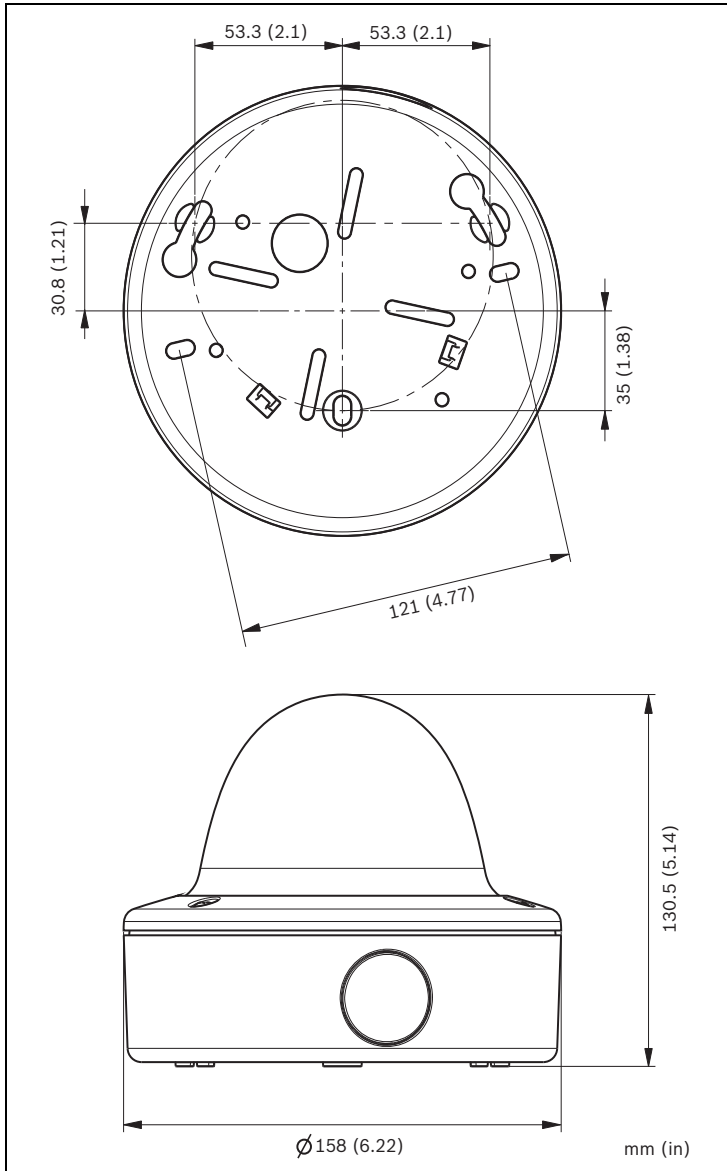
Figure 8.2 Dimensions - Surface-mount

8.1.2   **Accessories**

- – BNC to UTP transceiver
- – Surface Mount Box (SMB)
- – Pendant wall mount
- – Pendant ceiling mount
- – Corner mount

- – Bilinx communication interface box and software

Contact a Bosch representative in your area for the latest available accessories or visit our website at *www.boschsecurity.com*

Glossary

A

AES

Automatic Electronic Shutter (see Electronic iris).

Aperture

The size of the opening in the lens iris that controls the amount of light reaching the CCD Sensor. The larger the F-number, the less light reaches the sensor. An increase of one F-stop, halves the amount of light reaching the sensor.

AutoBlack

A technique of boosting the video signal level to produce a full amplitude video signal, even when the scene contrast is less than full range (glare, fog, mist, etc.).

Automatic Gain Control (AGC)

The electronics that regulate the gain or amplification of the video signal. AGC is used in low-light conditions with the iris fully open.

AutoIris

The lens iris opening is automatically adjusted to allow the correct illumination of the camera sensor. With a direct drive (DC) iris lens, the camera controls the aperture size. A video iris lens has the control circuit in the lens itself.

Auto Level Control (ALC)

The adjustment of the video level to give the desired brightness level. This can be done electronically or by means of an iris control.

Auto White Balance (AWB)

A feature that allows a color camera to automatically adjust its

output color to give a natural color, independent of the lighting used.

B

Backfocus

The distance between the image plane and the rear portion of the lens. Correct backfocus adjustment ensures that the camera remains in focus under various conditions.

Bilinx

A communications protocol that allows remote control, configuration, and updates to be performed over the video cable (Coax or Passive UTP).

Bilinx address

The address may be set locally using the Bilinx Configuration Tool for Imaging Devices (CTFID).

Back Light Compensation (BLC)

Selectively amplifies parts of the image to compensate for large contrast differences when only a portion of the image is brightly lit (e.g. a person in a sunlit doorway). See also Smart BLC.

C

Charged Coupled Device (CCD)

A CCD is a type of solid state image sensor used in CCTV cameras. The sensor converts light energy into electrical signals.

CCD Format

Indicates the size of the camera sensor used. In general, the larger the sensor, the more sensitive the camera and the better the image quality. The format is quoted in inches, for example 1/3 or 1/2 inch.

Color Temperature

A measure of the relative color of illumination. Generally used

to specify the color balance correction of a camera to achieve a natural color image.

D

Day/Night (infrared sensitive)

A camera that has normal color operation in situations where there is sufficient illumination (day conditions), but where the sensitivity can be increased when there is little light available (night conditions). This is achieved by removing the infrared cut filter required for good color rendition. The sensitivity can be further enhanced by integrating a number of fields to improve the signal-to-noise ratio of the camera (this may introduce motion blur).

Default Shutter

A feature allowing the shutter speed to be set to a fast speed to eliminate motion blur and provide a detailed and clear image of fast-moving objects while there is sufficient light. When light levels fall and other adjustments have been exhausted, the shutter speed reverts to the standard setting to maintain sensitivity.

Depth of Field

The distance from the nearest to the furthermost point that appears in focus. The smaller the aperture, the greater the depth of field.

Dynamic Noise Reduction (DNR)

A digital video processing technique that measures the noise (image artifacts) in the picture and automatically reduces it.

E

Electronic iris

Electronic iris (or AES - Automatic Electronic Shutter) adjusts the camera shutter speed to compensate for lighting changes. In some cases this can eliminate the need for an autoiris lens.

F

F-Number

> The standard measure of the lens aperture, which is the iris diameter, divided by the focal length of the lens. The lower the maximum aperture (F-Number or F-Stop), the more light that passes through the lens.

F-Stop   *See* F-Number

Field of View

> The measure of the visible area within the camera's field of view. The larger the focal length, the smaller the field of view. The smaller the focal length, the wider the field of view.

Focal Length

> The distance from the optical center of the lens to the image of an object located at an infinite distance from the lens. Long focal lengths give a small field of view (e.g. telephoto effect), while short focal lengths give a wide angle view.

I

Infrared Illumination

> Electromagnetic radiation (light) with a longer wavelength than is visible to the human eye. IR illumination is prominent at dusk and dawn and in incandescent lamps. IR illuminators come in the form of lamps with the appropriate filters, LEDs, or lasers. CCD sensors are less sensitive to IR than visible light, but IR can significantly increase the total illumination level, leading to a much better image at low light levels.

IRE (Institute of Radio Engineers)

> A measurement of video amplitude that divides the area from the bottom of sync to peak white level into 140 equal units - 140 IRE equals 1V peak-to-peak. The range of active video is 100 IRE.

L

Lens wizard

The lens wizard is used when setting the backfocus. It opens the iris fully while maintaining the correct video level using AES.

Lux

The international (SI) unit of measurement of the intensity of light. It is equal to the illumination of a surface one meter away from a single candle.

O

OSD

On-screen Display: Menus are shown on the display monitor.

P

Privacy Masking

The ability to mask out a specific area to prevent it from being viewed in order to comply with privacy laws and particular site requirements.

PWIE

Peak White Inverse Engine: White highlights are automatically turned black to reduce bright spots. Useful in traffic and car park applications.

R

Region of Interest

A specific area within a field of view, used by the motion detection algorithm to identify motion.

Resolution

The measure of the fine detail that can be seen in an image. For analog systems this is typically measured in horizontal Television Lines or TVL. The higher the TVL rating, the higher the resolution.

S

Saturation

The amplitude of the chrominance signal affecting the vividness of the color.

Sensitivity

A measure of the amount of light required to provide a standard video signal. Sensitivity values are stated in lux (*see* Lux).

SensUp (sensitivity up)

Increases camera sensitivity by increasing the integration time on the CCD (lowering shutter time from 1/50 s to 1/5 s in PAL or 1/60 s to 1/6 s in NTSC). This is accomplished by integrating the signal from a number of consecutive video fields to reduce signal noise.

Signal-to-noise ratio

The ratio between a useful video signal and unwanted noise measured in dB.

Smart BLC (Back Light Compensation)

Smart back-light compensation allows the camera to automatically compensate for bright areas of a high contrast scene without having to define a window or area.

U

UTP (Unshielded Twisted Pair)

A variant of twisted pair cabling, UTP cable is not surrounded by any shielding. The wires in a twisted pair cable are twisted around each other to minimize interference from the other twisted pairs in the cable. UTP is the primary wire type for telephone usage and the most commonly used type of networking cable.

V

VMD   Video Motion Detection: An algorithm for motion detection in which the camera compares the current image with a reference image and counts the number of pixels that have changed between the two images. An alarm is generated when the number of pixel changes exceeds a user-configured threshold.

W

WDR (Wide Dynamic Range)

A camera's dynamic range is the difference between the minimum and maximum acceptable signal levels. A scene with both very low and very high illumination levels requires a camera with a wide dynamic range to handle it correctly and produce a useful image.